



THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re the Application of: **HOSHI, George, et al.**

Group Art Unit: 3753

Serial No.: 10/511,431

Examiner: **PRICE, Craig James**

Filed: **June 14, 2005**

P.T.O. Confirmation No.: 8396

For: **FLUID CONTROL APPARATUS**

**BRIEF ON APPEAL**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

July 6, 2009

Sir:

This is a Brief on Appeal in response to the Final Office Action dated January 9, 2009, following the Notice of Appeal filed on April 6, 2009, extended from June 6, 2009, to July 6, 2009, by a one-month Petition for Extension of Time.

**I. REAL PARTIES OF INTEREST**

The real parties of interest in the subject application are the assignees of record, CKD Corporation of Komaki-shi, Japan, and Fujikin Incorporated of Osaka-shi, Japan.

**II. RELATED APPEALS AND INTERFERENCES**

There are no related appeals and/or interferences.

### III. STATUS OF THE CLAIMS

This is an appeal from the Office Action dated January 9, 2009, in which claims 1-7 were finally rejected, and claims 10-14 were allowed. Thus, the claims on appeal are claims 1-7.

### IV. STATUS OF AMENDMENTS

Claims 1-6 were the originally filed claims.

Claims 1-6 were amended and new claim 7 was added in an Amendment dated January 10, 2007, in response to an Office Action dated October 10, 2006. These amendments were entered.

Claims 1-2 were amended and new claims 8-9 were added in an Amendment dated August 20, 2007, in response to an Office Action dated May 18, 2007. These amendments were entered.

Claim 1 was amended in an Amendment dated February 7, 2008, in response to an Office Action dated November 7, 2007. These amendments were entered after an RCE had been filed on May 7, 2008, in response to an Advisory Action dated March 6, 2008.

Claims 1-2, 5 and 7 were amended, claims 8-9 were canceled and new claims 10-14 were added in an Amendment dated September 29, 2008, in response to an Office Action dated May 28, 2008. These amendments were entered.

## V. SUMMARY OF THE CLAIMED SUBJECT MATTER

The subject invention relates generally to a fluid control apparatus for use in semiconductor fabrication equipment, and more particularly to fluid control apparatus which requires heating of a fluid. (Page 1, lines 5-8).

More specifically as shown in Figures 1 and 2, a fluid control apparatus according to **independent claim 1** comprises a plurality of lines A and B arranged in parallel on a base member 1, the lines having their inlets, as well as their outlets, facing toward the same direction (Page 6, line 1, to page 7 line 2). Each of the lines A and B comprises a plurality of fluid control devices 2-7 arranged in an upper stage and a plurality of block coupling members 8 arranged in a lower stage. A feature of the subject control apparatus being that at least one of the lines A and B is provided on each of opposite sides thereof with a tape heater 11 (Page 7, lines 2-9).

The claimed fluid control apparatus further includes a holding clip 13 for the tape heater 11, the clip being of an inverted U-shape with flat opposed walls and being removably attached to the tape heater, a space for positioning the tape heater holding clip therein being provided in each of

locations between adjacent fluid control devices. The tape heaters 11 are held from opposite sides thereof to block bodies of the fluid control devices 2-7 with a resilient force acting to reduce the spacing between the opposed walls of the clip (Page 8, lines 14-22). The line provided with heaters 11 is mounted on a line support member 10 removably attached to the base member 1 (Page 9, lines 8-15).

Additionally, the fluid control apparatus according to claim 1 has the base member 1 in the form of a frame. This frame comprises a plurality of lateral rails 1a extending in a direction orthogonal to the lines A and B (Page 7, line 27 to page 8, line 1).

The fluid control apparatus according to **independent claim 2**, like that of **independent claim 1**, comprises a plurality of lines A and B arranged in parallel on a base member 1, the lines having their inlets, as well as their outlets, facing toward the same direction (Page 6, line to page 7 line 2). Each of the lines A and B comprises a plurality of fluid control devices 2-7 arranged in an upper stage and a plurality of block coupling members 8 arranged in a lower stage.

A feature of the subject control apparatus is each of the lines A and B is mounted on a line support member 10 removably attached to the base member 1. Further, the line support member 10 has a heater insertion bore 14 formed therein and which extends longitudinally thereof, and a sheath heater 12 inserted into the bore without insulating material (Page 8, line 28 to page 9, line 7). Each of the block coupling members 8 is slidably mounted on the line support member 10, and each of

the fluid control devices 2-7 is mounted on at least two adjacent coupling members (Page 9, lines 8-13).

Additionally, the fluid control apparatus according to claim 2 has the base member 1 in the form of a frame. This frame comprises a plurality of lateral rails 1a extending in a direction orthogonal to the lines A and B (Page 7, line 27 to page 8, line 1).

Claim 3, dependent upon independent claim 1, relates to a fluid control apparatus where the line support member 10 has a heater insertion bore 14 formed therein and which extends longitudinally thereof, and a sheath heater 12 inserted into the bore (Page 8, line 28 to page 9, line 7).

**Claim 4**, dependent upon **claim 1** or **claim 3**, recites that each of the coupling members is slidably mounted on the line support member, and each of the fluid control devices is mounted on at least two adjacent coupling members.

**Claim 5**, dependent upon **claim 1** or **claim 3**, recites that the lateral rails 1a are made of a nonmetallic material and that the line support member 10 of each of the lines is mounted on the base member 1 slidably in a lateral direction (Page 9, lines 10-15).

**Claim 6**, also dependent upon **independent claim 1**, requires that the tape heater is held in contact with bodies of the fluid control devices and with the block coupling members.

The fluid control apparatus according to **independent claim 7**, like that of **independent claim 2**, comprises a plurality of lines A and B arranged in parallel on a base member 1, the lines having their inlets, as well as their outlets, facing toward the same direction (Page 6, line to page 7 line 2). Each of the lines A and B comprises a plurality of fluid control devices 2-7 arranged in an upper stage and a plurality of block coupling members 8 arranged in a lower stage. A feature of the subject fluid control apparatus, like that of **independent claim 2**, is that each of the lines A and B is mounted on a line support member 10 removably attached to the base member 1. Further, the line support member 10 has a heater insertion bore 14 formed therein and which extends longitudinally and a sheath heater 12 is inserted into the bore (Page 8, line 28 to page 9, line 7).

Additionally, the base member 1 of the fluid control apparatus has a plurality of lateral rails 1a made of a nonmetallic material and which extend in a direction orthogonal to the lines, the line support member 10 of each of the lines being mounted on the base member 1 slidably in a lateral direction (Page 9, lines 10-15).

The claimed fluid control apparatus of **independent claim 7** further includes a clip 13 being a thin metal plate of inverted U-shape (Page 8, lines 17-23). The clip 13 has a top wall 13b having

a shortened front-to-rear width so that there is a space for positioning the top wall 13b on each of the front and rear sides of the controller 2 (Page 8, lines 24-27).

## VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

### A. Summary of the Issues

(1) The first issue presented for review is whether claim 7 was properly objected to under 37 CFR 1.75 as being a substantial duplicate of allowed claim 10.

(2) The second issue presented for review is whether claims 1, 4/1, 6 and 8 (presumably claim 7 since claim 8 has been canceled) were properly rejected in the Office Action of January 9, 2009, under 35 USC § 103(a) as being unpatentable over the patent to Johnson (6,076,543), in view of the patent to Ikeda et al (6,014,498) and further in view of the patent to Mittendorf (2,819,858).

(3) The third presented for review is whether dependent claim 3 was properly rejected under 35 USC § 103(a) as being unpatentable over the patents to Johnson '543, Ikeda et al '498 and Mittendorf '858 and further in view of the patent to Lengstorf (3,733,459).

(4) The fourth issue presented for review is whether claim 2 was properly rejected under 35 USC § 103(a) as being unpatentable over the patents to Johnson '543 and Lengstorf (3,733,459).

(5) The fifth issue presented for review is whether claims 2, 3, 4/3, and 5 were properly rejected under 35 USC § 103(a) as being unpatentable over the patents to Johnson '543 and Ikeda et al '498 and further in view of the patent to Lengstorf (3,733,459).

B. Summary of the Examiner's Rejections

In making objection or rejection (1), claim 7 was objected to under 37 CFR 1.75 as being a substantial duplicate of allowed claim 10.

In making rejection (2), the examiner asserted that the Johnson et al patent teaches the entire fluid control apparatus as set forth in the noted claims with the exception of the provisions of (1) a tape heater on opposite sides of the line and (2) the tape heaters being held with a resilient force of a clip. The Ikeda et al patent was then cited to allegedly supply the first teaching deficiency and the patent to Mittendorf was cited as supplying the second teaching deficiency.

In rejection (3), it was acknowledged that dependent claim 3 was rejected under 35 USC § 103(a) as being unpatentable over the above cited patents to Johnson et al, Ikeda et al and Mittendorf further in view of the patent to Lengstorf.

In making rejection (4), the examiner asserted that independent claim 2 was rejected under 35 USC § 103(a) as being unpatentable over the above patent to Johnson et al in view of the patent to Lengstorf. In making this rejection, the Johnson et al patent was relied upon as above and then



it was asserted that the Lengstorf patent teaches the use of a support member having a heater insertion bore along the length thereof and a sheath heater inserted in the bore without insulation.

In making rejection (5) it was asserted that Claims 2, 3, 4/3 and 7 were rejected the above cited patent to Johnson et al in view of the above cited patents to Ikeda et al and Lengstorf. This this rejection was based on a combination of the teachings the same patents as were discussed above in the previous rejections.

## VII. ARGUMENTS

Rejection (1) - It is submitted that the objection must fail since claims 7 and 10 are not substantially identical or duplicates. From a comparison of the subject matter of claims 7 and 10, it is submitted that there are significant differences in both the language and the scope of the claims. For the purpose of comparison, following is a copy of each claim where the differences are underlined.

Claim 7: A fluid control apparatus comprising a plurality of lines arranged in parallel on a base member and having inlets, as well as outlets, facing toward the same direction, each of the lines comprising a plurality of fluid control devices arranged in an upper stage and a plurality of block coupling members arranged in a lower stage, the fluid control apparatus being characterized in that each of the lines is mounted on a line support member removably attached to the base member, the line support member having a heater insertion bore formed therein and extending longitudinally thereof, a sheath heater being inserted into the bore, wherein the base member has a plurality of lateral rails made of a nonmetallic material and extending

in a direction orthogonal to the lines, the line support member of each of the lines being mounted on the base member slidably in a lateral direction;

wherein the clip is made from a thin metal plate of inverted U-shape, the clip having a top wall having a shortened front-to-rear width so that there is a space for positioning the top wall on each of the front and rear sides of the controller.

Claim 10: A fluid control apparatus comprising a plurality of lines arranged in parallel on a base member and having inlets, as well as outlets, facing toward the same direction, each of the lines comprising a plurality of fluid control devices arranged in an upper stage and a plurality of block coupling members arranged in a lower stage, the fluid control apparatus being characterized in that at least one of the lines is provided on each of opposite sides thereof with a tape heater, a tape heater holding clip being of an inverted U-shape with flat opposed walls and being removably attached to the tape heater, a space for positioning the tape heater holding clip therein being provided in each of locations between adjacent fluid control devices, the tape heaters being held from opposite sides thereof to block bodies of the fluid control devices with a resilient force acting to reduce the spacing between the opposed walls of the clip, the line provided with the heaters being mounted on a line support member removably attached to the base member;

wherein the clip is made from a thin metal plate of inverted U-shape, the clip having a top wall having a shortened front-to-rear width so that there is a space for positioning the top wall on each of the front and rear sides of the controller.

From the above, it is very difficult to determine the basis for the objection of the examiner given these differences.

With respect to rejection (2), it is submitted that the cited Johnson et al, Ikeda et al and Mittendorf patents, whether taken singly or in combination, do not teach or suggest a fluid control apparatus as defined by claims 1 and 2. More particularly, it is submitted that these patents do not teach or suggest, among other things, the distinguishing characteristic of a base member in the form of a frame comprising a plurality of lateral rails extending in a direction orthogonal to the lines in a subject fluid control apparatus as presently claimed.

It is further submitted that the cited patent to Mittendorf does not supply the above noted teaching deficiencies. In this regard, it is to be further noted that the clip according to the Mittendorf patent fixes the rod-like heater, and does not hold the tape heater to the block body of the fluid control apparatus. Accordingly, "the line" in present claim 1 has been amended to recite "block bodies of the fluid control devices."

Moreover, the clip of the Mittendorf patent is different from the present invention also in shape of the clip, since the clip of the patent is C-shaped while that of the presently claimed invention is U-shaped.

In summary, it is again submitted that with respect to rejection (1) that there is no suggestion or motivation to combine the above two disclosures, and one of ordinary skill in the art would not be led to do so. Among other things (1), the teachings of the would not render obvious the present invention

For the reasons stated above, withdrawal of the rejection under 35 U.S.C. §103(a) and allowance of claims 1, 4/1 and 6-7 over the cited patents are respectfully requested.

Regarding rejection (3), dependent claim 3 was rejected as being unpatentable over the above cited patents to Johnson et al, Ikeda et al and Mittendorf further in view of the patent to Lengstorf.

Inasmuch as this rejection is based on basically the same patents as discussed in the above rejection, it is submitted that the rejection has been overcome for the reasons discussed above over combination of the first three of the cited patents.

As to rejection (4) of independent claim 2 in view of the cited patent publication to Johnson et al in view of the patent to Lengstorf, it is submitted the considerations as set forth above with respect to rejection 1 are applicable as well. Among other things, neither patent publication teaches a line support member removably attached to a base member as disclosed in the subject application. In addition, it is further asserted that the patent to Lengstorf does not have the structure composed of an upper stage, a lower stage, a line support member and a base member as is presently claimed.

Inasmuch as this rejection is based on basically the same patents as discussed in the above rejection, it is submitted that the rejection has been overcome for the reasons discussed above over combination of the first three of the cited patents.

Furthermore, the Lengstorf patent discloses a structure of a valve alone, and plate 30 does not support a line. Therefore, the combination of the publications to Lengstorf and Johnson would be similar to that shown in the attached of the attached Appendix XI, not the present invention (the

line support member having a heater insertion bore formed therein and extending longitudinally thereof).

It therefore is submitted that any combination of the cited patent publication to Johnson et al further in view of the patent to Lengstorf would not render obvious the present invention. Accordingly, it is submitted that the rejection has been overcome for the reasons discussed above over combination of the first cited patents.

Rejection (5) was directed to claims 2, 3, 4/3 and 5 in view of the above cited patent to Johnson et al in view of the above cited patents to Ikeda et al and Lengstorf. As before, since this rejection is based on the same patents as discussed above, it is submitted this rejection is inapplicable on the same basis as the above rejection over combinations of two of the cited patents.

For the reasons stated above, withdrawal of the rejection of claims 2, 3, 4/3 and 5 over the cited patents is believed to be in order.

### **SUMMARY**

For the reasons stated above, it is submitted that claims 1 through 7 are patentable over the cited patent publications and are in condition for allowance. It is therefore requested that the rejections set forth in recent Office Action should be reversed.

In the event this paper is not timely filed, appellants hereby petitions for an appropriate extension of time. The fee for any such extension may be charged to our Deposit Account No. 01-2340, along with any other additional fees which may be required with respect to this paper.

Respectfully submitted,

KRATZ, QUINTOS & HANSON, LLP



Donald W. Hanson  
Attorney for Appellants  
Reg. No. 27,133

DWH/evb

Atty. Docket No. **040549**  
Suite 400  
1420 K Street, N.W.  
Washington, D.C. 20005  
(202) 659-2930



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PATENT & TRADEMARK OFFICE

Enclosures: Appendices VIII - XI

**APPENDIX VIII - CLAIMS**

Claim 1 (Previously Presented): A fluid control apparatus comprising a plurality of lines arranged in parallel on a base member and having inlets, as well as outlets, facing toward the same direction, each of the lines comprising a plurality of fluid control devices arranged in an upper stage and a plurality of block coupling members arranged in a lower stage, the fluid control apparatus being characterized in that at least one of the lines is provided on each of opposite sides thereof with a tape heater, a tape heater holding clip being of an inverted U-shape with flat opposed walls and being removably attached to the tape heater, a space for positioning the tape heater holding clip therein being provided in each of locations between adjacent fluid control devices, the tape heaters being held from opposite sides thereof to block bodies of the fluid control devices with a resilient force acting to reduce the spacing between the opposed walls of the clip, the line provided with the heaters being mounted on a line support member removably attached to the base member;

the base member in the form of a frame comprising a plurality of lateral rails extending in a direction orthogonal to the lines.

Claim 2 (Previously Presented): A fluid control apparatus comprising a plurality of lines arranged in parallel on a base member and having inlets, as well as outlets, facing toward the same direction, each of the lines comprising a plurality of fluid control devices arranged in an upper stage and a plurality of block coupling members arranged in a lower stage, the fluid control apparatus being characterized in that each of the lines is mounted on a line support member removably attached

to the base member, the line support member having a heater insertion bore formed therein and extending longitudinally thereof, a sheath heater being inserted into the bore without insulating material, wherein each of the coupling members is slidably mounted on the line support member, and each of the fluid control devices is mounted on at least two adjacent coupling members;

the base member in the form of a frame comprising a plurality of lateral rails extending in a direction orthogonal to the lines.

Claim 3 (Previously Presented): A fluid control apparatus according to claim 1 wherein the line support member has a heater insertion bore formed therein and extending longitudinally thereof, and a sheath heater is inserted into the bore.

Claim 4 (Previously Presented): A fluid control apparatus according to claim 1 or claim 3 wherein each of the coupling members is slidably mounted on the line support member, and each of the fluid control devices is mounted on at least two adjacent coupling members.

Claim 5 (Previously Presented): A fluid control apparatus according to any one of claims 1 to 3 which is characterized in that the lateral rails are made of a nonmetallic material, the line support member of each of the lines being mounted on the base member slidably in a lateral direction.



Claim 6 (Previously Presented): A fluid control apparatus according to claim 1 wherein the tape heater is held in contact with bodies of the fluid control devices and with the block coupling members.

Claim 7 (Previously Presented): A fluid control apparatus comprising a plurality of lines arranged in parallel on a base member and having inlets, as well as outlets, facing toward the same direction, each of the lines comprising a plurality of fluid control devices arranged in an upper stage and a plurality of block coupling members arranged in a lower stage, the fluid control apparatus being characterized in that each of the lines is mounted on a line support member removably attached to the base member, the line support member having a heater insertion bore formed therein and extending longitudinally thereof, a sheath heater being inserted into the bore, wherein the base member has a plurality of lateral rails made of a nonmetallic material and extending in a direction orthogonal to the lines, the line support member of each of the lines being mounted on the base member slidably in a lateral direction;

wherein the clip is made from a thin metal plate of inverted U-shape, the clip having a top wall having a shortened front-to-rear width so that there is a space for positioning the top wall on each of the front and rear sides of the controller.

Claims 8-9 (Canceled):

Claim 10 (Previously Presented): A fluid control apparatus comprising a plurality of lines arranged in parallel on a base member and having inlets, as well as outlets, facing toward the same

direction, each of the lines comprising a plurality of fluid control devices arranged in an upper stage and a plurality of block coupling members arranged in a lower stage, the fluid control apparatus being characterized in that at least one of the lines is provided on each of opposite sides thereof with a tape heater, a tape heater holding clip being of an inverted U-shape with flat opposed walls and being removably attached to the tape heater, a space for positioning the tape heater holding clip therein being provided in each of locations between adjacent fluid control devices, the tape heaters being held from opposite sides thereof to block bodies of the fluid control devices with a resilient force acting to reduce the spacing between the opposed walls of the clip, the line provided with the heaters being mounted on a line support member removably attached to the base member;

wherein the clip is made from a thin metal plate of inverted U-shape, the clip having a top wall having a shortened front-to-rear width so that there is a space for positioning the top wall on each of the front and rear sides of the controller.

Claim 11 (Previously Presented): A fluid control apparatus according to claim 10 wherein the line support member has a heater insertion bore formed therein and extending longitudinally thereof, and a sheath heater is inserted into the bore.

Claim 12 (Previously Presented): A fluid control apparatus according to claim 10 or claim 11 wherein each of the coupling members is slidably mounted on the line support member, and each of the fluid control devices is mounted on at least two adjacent coupling members.

Claim 13 (Previously Presented): A fluid control apparatus according to any one of claims 10 or 11 which is characterized in that the base member has a plurality of lateral rails made of a nonmetallic material and extending in a direction orthogonal to the lines, the line support member of each of the lines being mounted on the base member slidably in a lateral direction.

Claim 14 (Previously Presented): A fluid control apparatus according to claim 10 wherein the tape heater is held in contact with bodies of the fluid control devices and with the block coupling members.

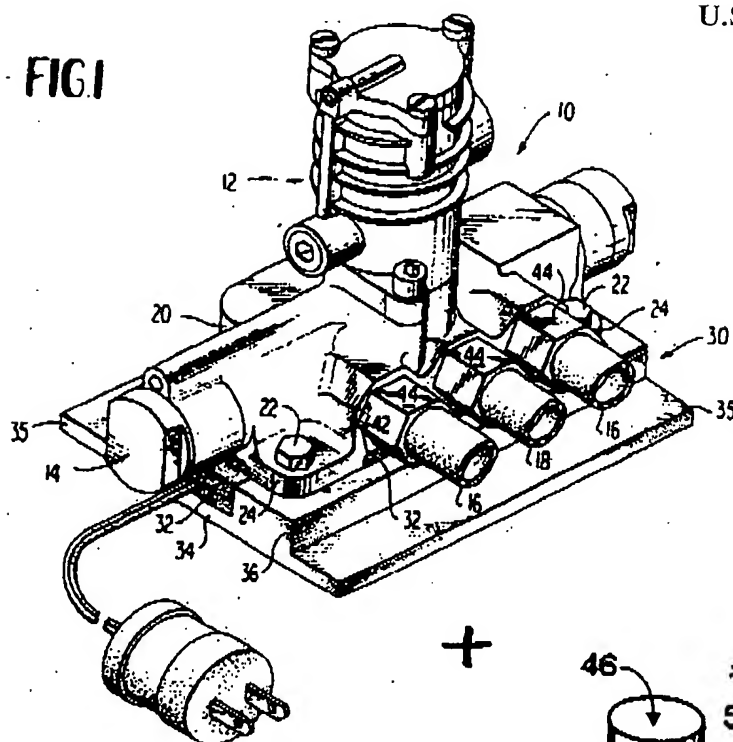
**APPENDIX IX - EVIDENCE**

Not Applicable

**APPENDIX X - RELATED PROCEEDINGS**

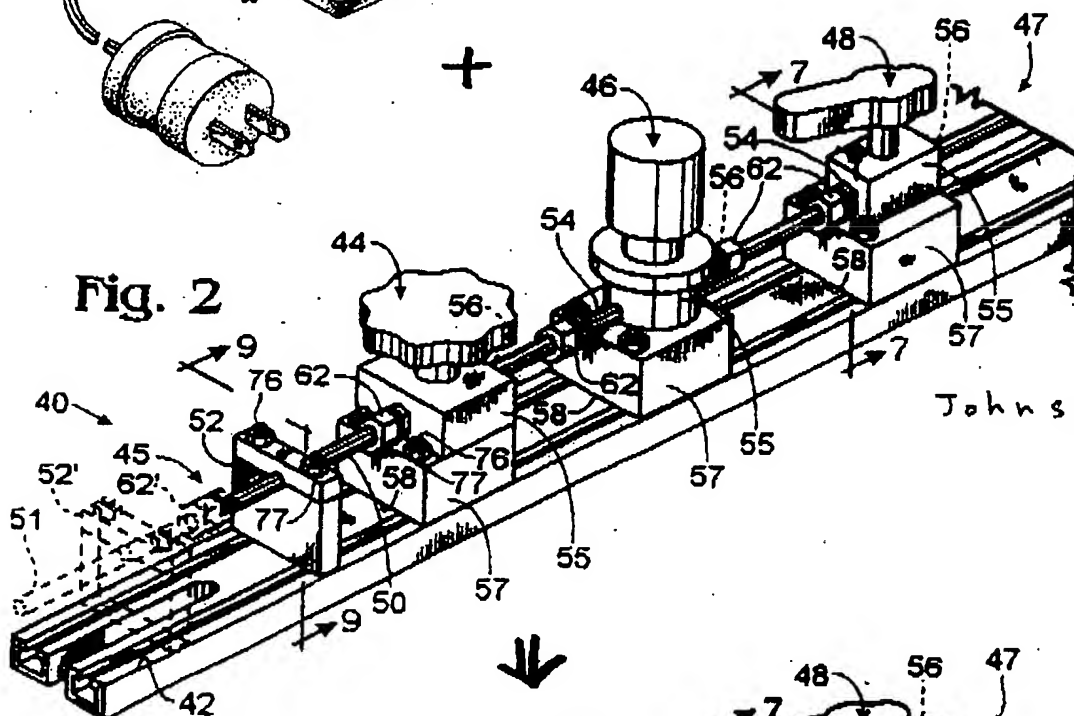
Not Applicable.

FIG. 1



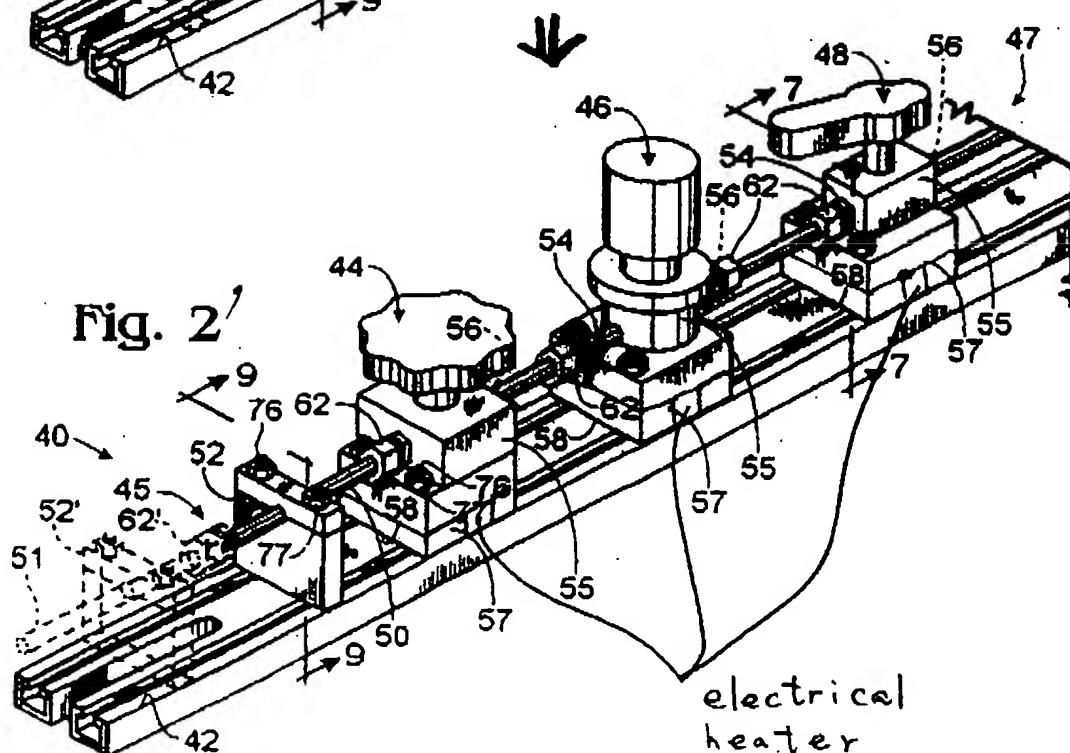
Lengstorf

Fig. 2



Johnson

Fig. 2'



electrical  
heater